Fig.1

Primer Sequences for PCR amplification of any SSA gene.

Primer names ECP 1 and ECP 2 [Expression cloning Primer (ECP)]

ECP 1 => 5'CAT AAA ATT TCT AAG ACG AAG GAT CCC TAT GTC 3'

ECP 2 => 5'GAG AGA AAG TTC CCC GTG TGA ATT CTA GCT AGG 3'

Fig.2A

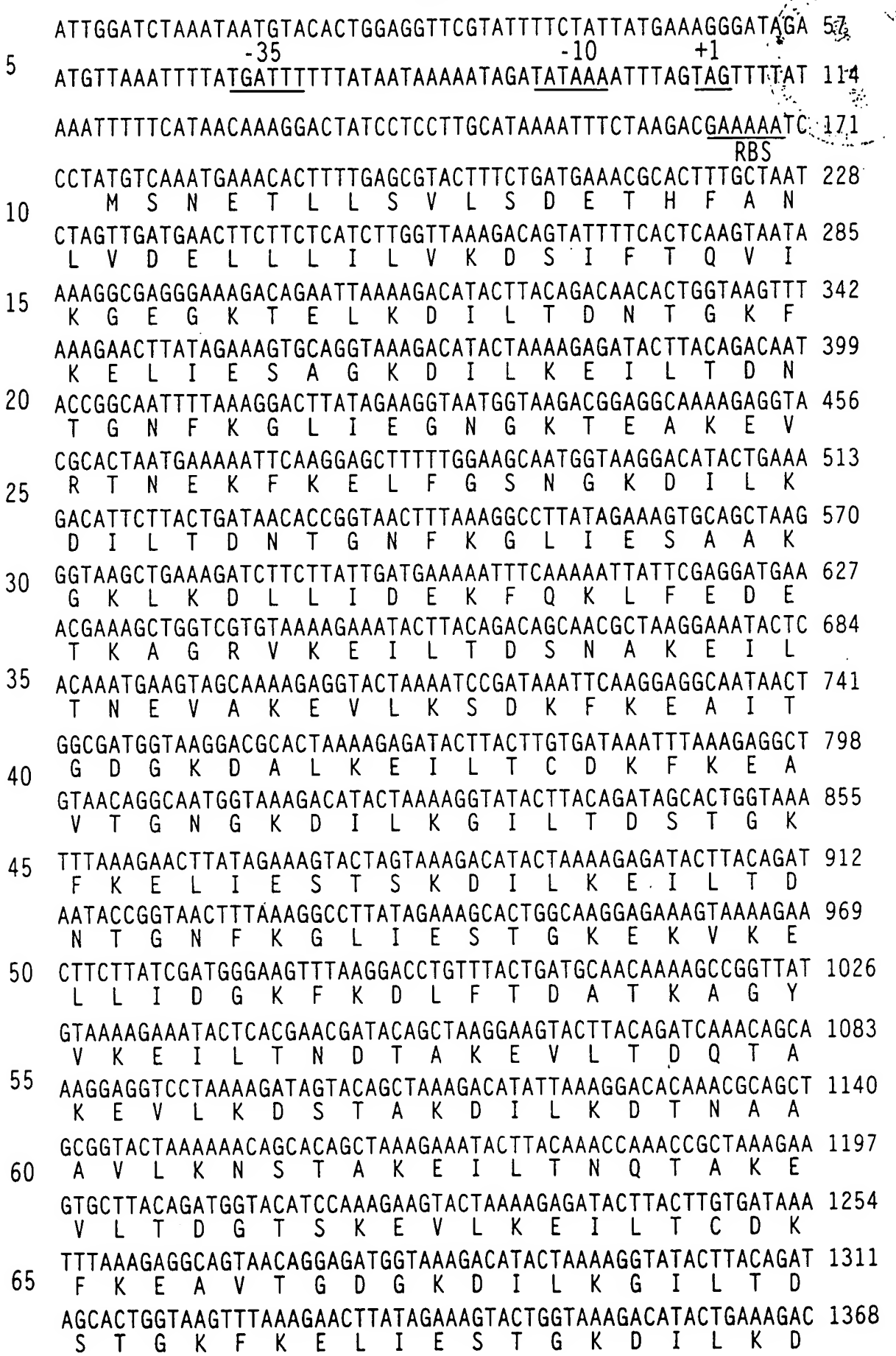

Fig.2B

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GCCGGGAAGGATGAAGCAAAAGCAGTACTTACTGACGAGAAATTTAAAGGCTTGTTT 1539
 A  G  K  D  E  A  K  A  V  L  T  D  E  K  F  K  G  L  F

GATGACAAAACAATAGCTGGCTATGTAAAAGAAATACTCACCAGCGAGAAGTTTAAA 1596
 D  D  K  T  I  A  G  Y  V  K  E  I  L  T  S  E  K  F  K

AAACTGTTTGAAAGTGCAGGTAAGACTAAAGTAAAAGAACTCCTCATTGATGAGAAG 1653
 K  L  F  E  S  A  G  K  T  K  V  K  E  L  L  I  D  E  K

TTTCAAAAATTATTTGAGGATGACACGAAAGCCAGTCATGTAAAAGAAATACTCACG 1710
 F  Q  K  L  F  E  D  D  T  K  A  S  H  V  K  E  I  L  T

AACGATACAGCTAAGGAAATACTTACAGATCAAACAGCTAAAGAAGTCCTAAAGGAT 1767
 N  D  T  A  K  E  I  L  T  D  Q  T  A  K  E  V  L  K  D

AGTACAGCTAAAGAGATATTAAAGGACACAAACGCAGCTGCGCTACTAAAAGACAGC 1824
 S  T  A  K  E  I  L  K  D  T  N  A  A  A  L  L  K  D  S

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 H  E  K  F  K  D  L  F  N  V  K  T  T  A  G  Y  V  K  E

ATACTTACCAGCGACAAGTTTAAAGAACTGTTTACTGATGCAACAAAAGCTGGCTAC 2223
 I  L  T  S  D  K  F  K  E  L  F  T  D  A  T  K  A  G  Y

GTGAAAGAAATACTCACGAACGATACAGCTAAGGAAATACTTACAGATCAAACAGCT 2280
 V  K  E  I  L  T  N  D  T  A  K  E  I  L  T  D  Q  T  A

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GCAATAACAGGTGCCGGTAAAGATGAGCTAAAATACATACTCACTAATAGCGAGTTT 2451
 A  I  T  G  A  G  K  D  E  L  K  Y  I  L  T  N  S  E  F

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 K  S  L  F  H  S  K  D  S  A  E  A  V  K  A  I  F  T  H

AATAAGTTTAAAGAACTACTTGAACATGCAAGAACAACCCAAACAATACGCAGGCGC 2565
 N  K  F  K  E  L  L  E  H  A  R  T  T  Q  T  I  R  R  R

TTTGCAAATGCTTTAGATCAACTAAAAGCGCTAATTACCTGTGGCAGCGGTGATCAT 2622
 F  A  N  A  L  D  Q  L  K  A  L  I  T  C  G  S  G  D  H
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Fig.2C

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AGTAATTTTAGCTGTGCAAACTGCAGTAGTACAACAACTGCATAATTACGTAGCGCT 2736
S N F S C A N C S S T T T A *
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Transcription termination
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Fig.3A

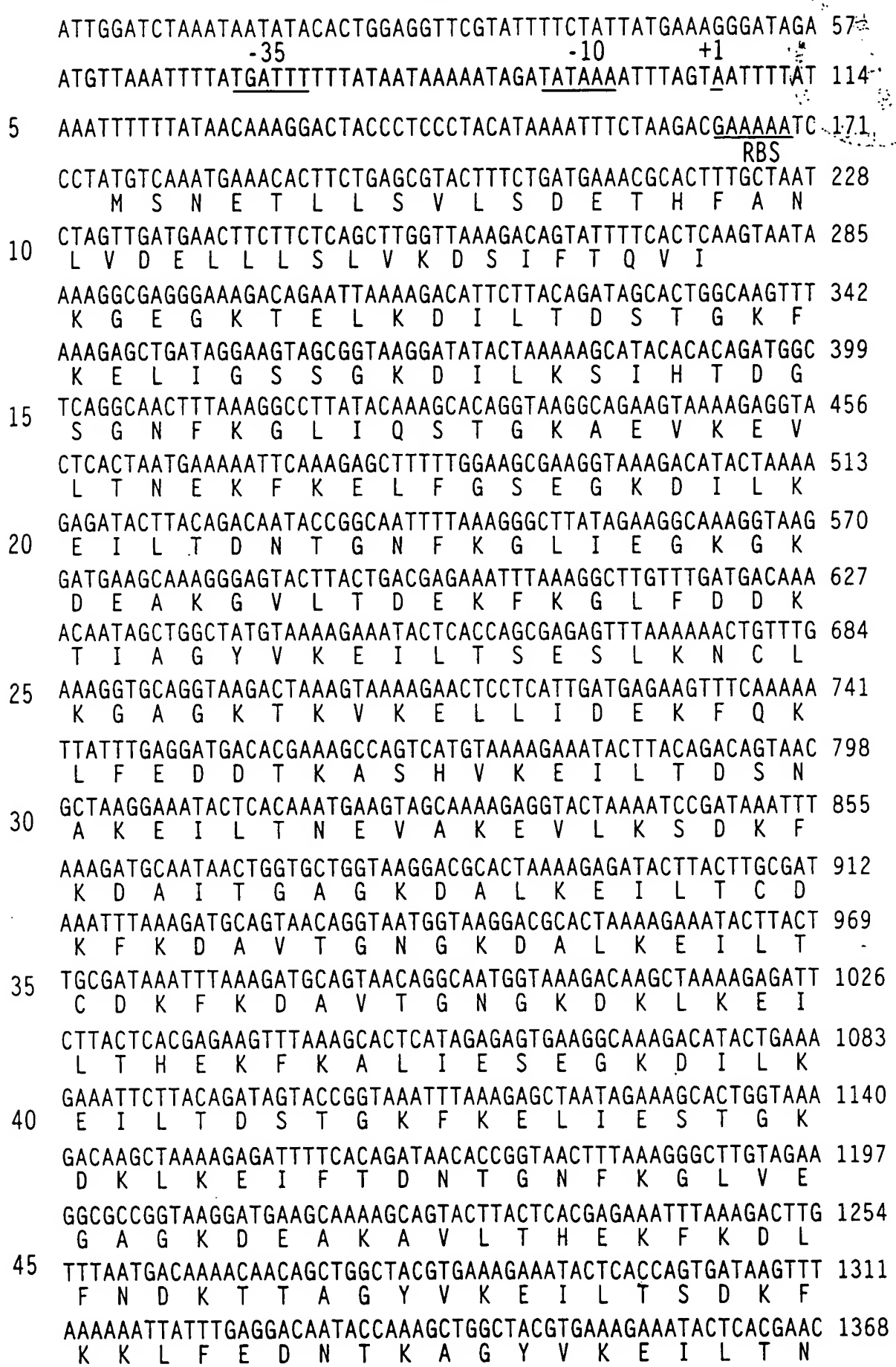
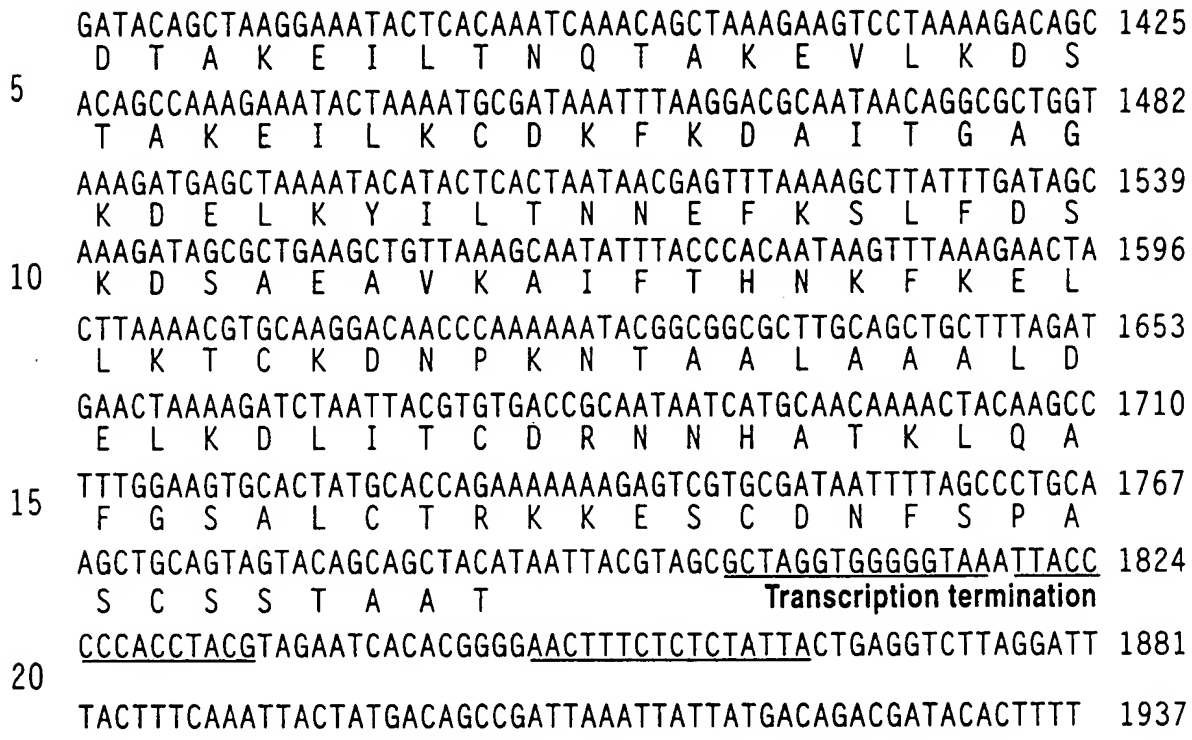


Fig.3C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T A K E I L K C D K F K D A I T G A G
AAAGATGAGCTAAAATACATACTCACTAATAACGAGTTTAAAAGCTTATTTGATAGC 1539
K D E L K Y I L T N N E F K S L F D S
AAAGATAGCGCTGAAGCTGTTAAAGCAATATTTACCCACAATAAGTTTAAAGAACTA 1596
K D S A E A V K A I F T H N K F K E L
CTTAAAACGTGCAAGGACAACCCAAAAAATACGGCGGCGCTTGCAGCTGCTTTAGAT 1653
L K T C K D N P K N T A A L A A A L D
GAACTAAAAGATCTAATTACGTGTGACCGCAATAATCATGCAACAAAACTACAAGCC 1710
E L K D L I T C D R N N H A T K L Q A
TTTGGAAGTGCACTATGCACCAGAAAAAAAGAGTCGTGCGATAATTTTAGCCCTGCA 1767
F G S A L C T R K K E S C D N F S P A
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S C S S T A A T
Transcription termination
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Fig.4A

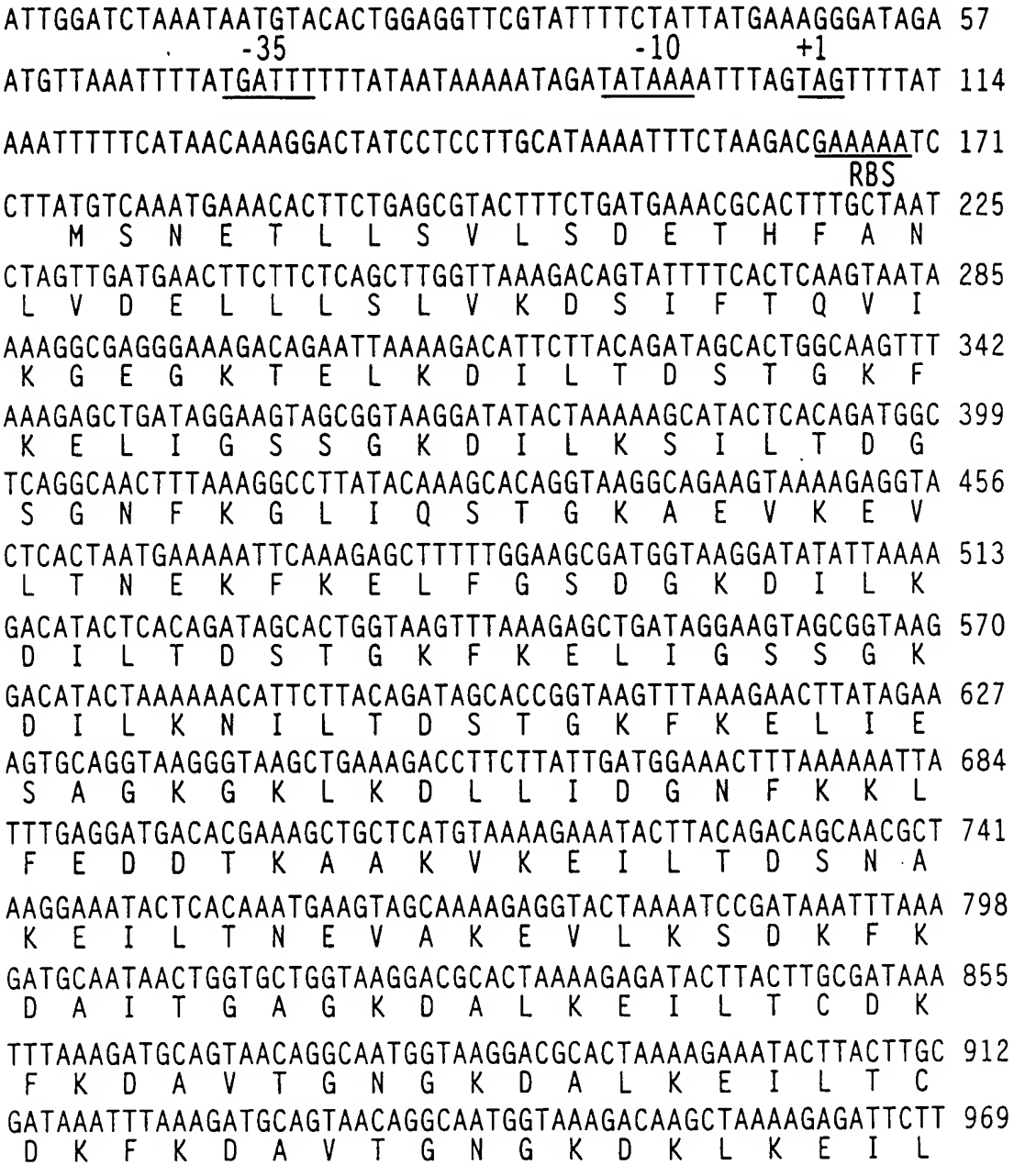

Fig.4B

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 I  L  T  D  S  T  G  K  F  K  E  L  I  E  S  T  G  K  D
GAAGCAAAAGCAGTACTTACTGACGAGAAATTTAAAGACTTGTTTAATGACAAAACA 1140
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 T  A  G  Y  V  K  E  I  L  T  S  D  K  F  K  K  L  F  E
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 D  N  T  K  A  G  Y  V  K  E  I  L  T  N  D  T  A  K  E
ATACTTACCAATCATAAATTTAAGGAAGCAATAACTGGCGATGGTAAAGACATACTG 1311
 I  L  T  N  H  K  F  K  E  A  I  T  G  D  G  K  D  I  L
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 K  E  I  L  T  D  S  T  G  N  F  K  G  A  I  T  G  A  G
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 K  D  Q  L  K  Y  I  L  T  N  S  E  F  K  S  L  F  D  S
AAAGATAGCGCTGAAGCTGTTAAAGAAATATTTACCCACAGTAAGTTTAAAGAACTA 1482
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CTTAAAACGTGCAAGGACAACCCAAAAAATACGGCGGCGCTTGCAGCTGCTTTAGAT 1539
 L  K  T  C  K  D  N  P  K  N  T  A  A  L  A  A  A  L  D
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 F  G  S  A  L  C  T  R  K  K  E  S  C  D  N  F  S  S  A
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 N  C  S  S  T  T  T  A  *                  Transcription termination
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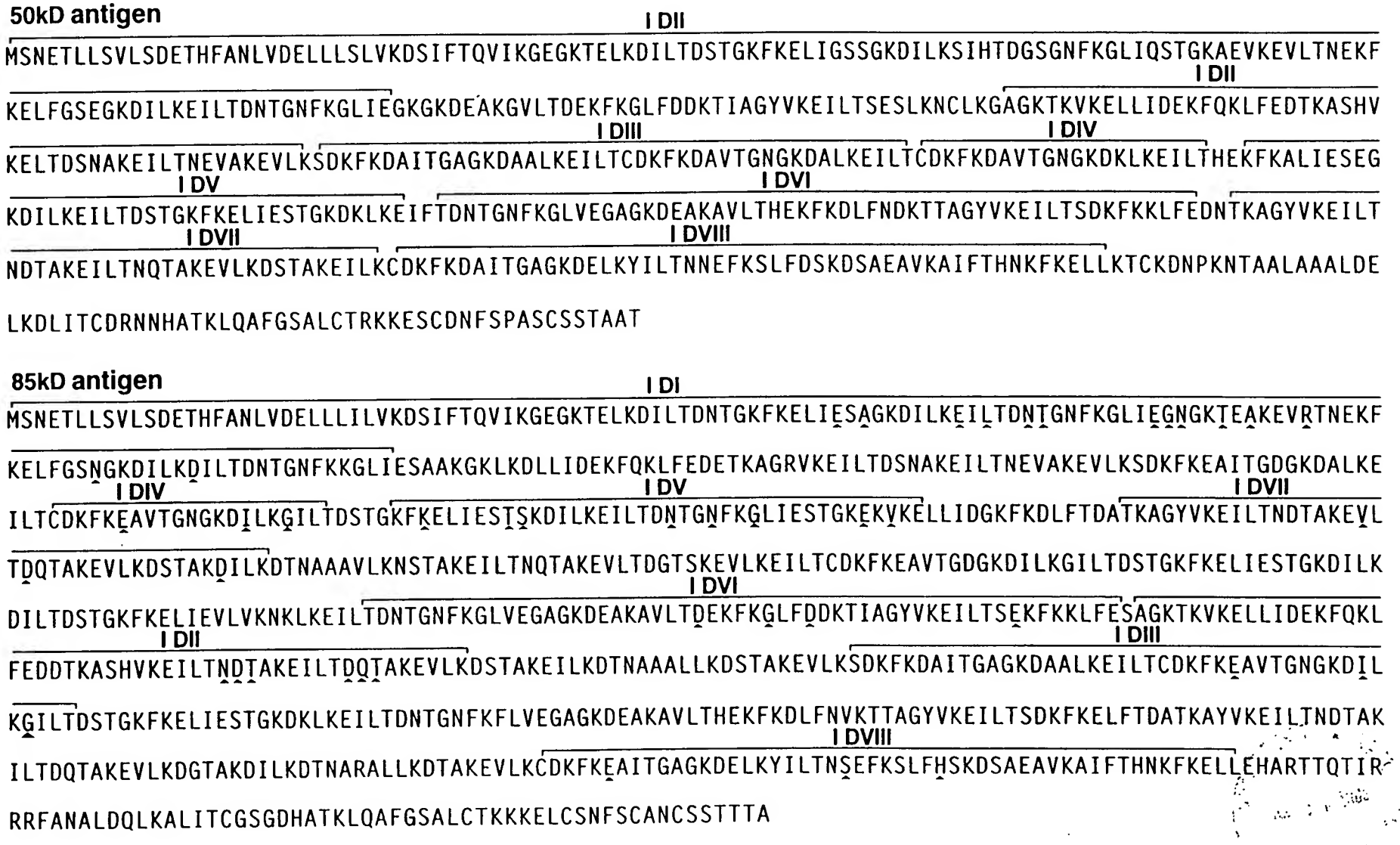
Fig.5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I DIII
I DIV
KELTDSNAKEILTNEVAKEVLKSDKFKDAITGAGKDAALKEILTCDKFKDAVTGNGKDALKEILTCDKFKDAVTGNGKDKLKEILTHEKFKALIESEG
I DV
I DVI
KDILKEILTDSTGKFKELIESTGKDKLKEIFTDNTGNFKGLVEGAGKDEAKAVLTHEKFKDLFNDKTTAGYVKEILTSDKFKKLFEDNTKAGYVKEILT
I DVII
I DVIII
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85kD antigen
I DI
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I DIV
I DV
I DVII
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I DII
I DIII
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I DVIII
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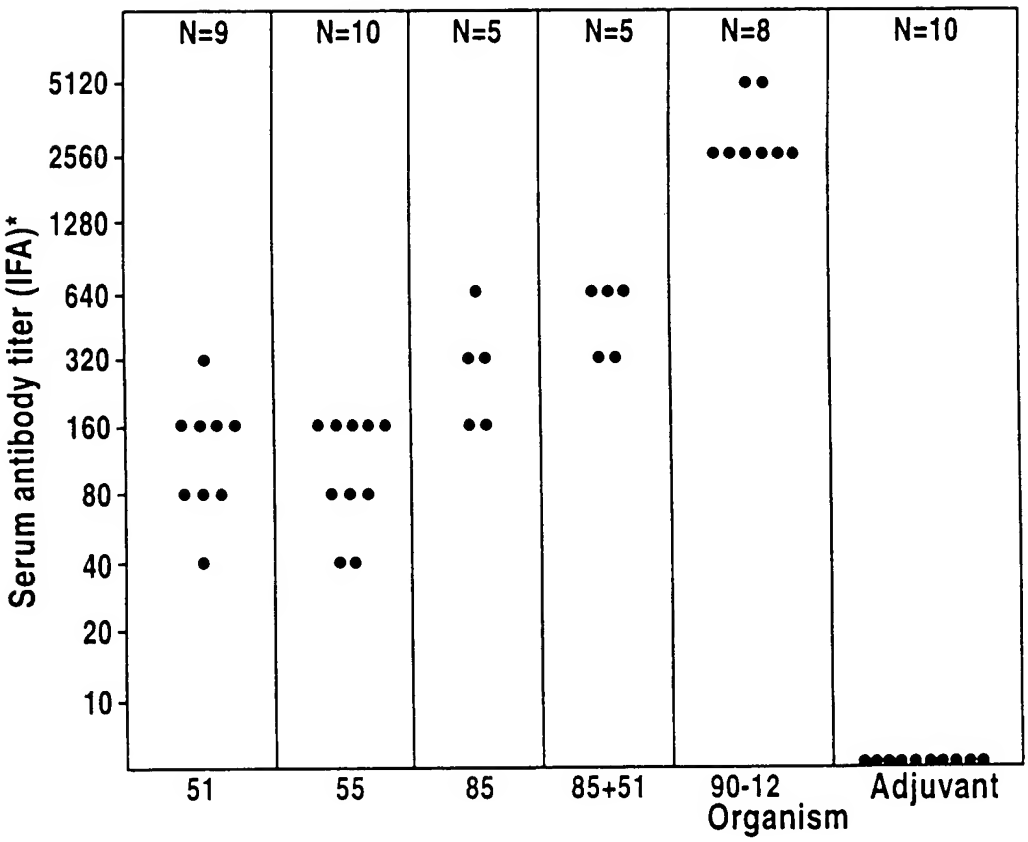
Fig.6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N=5
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160
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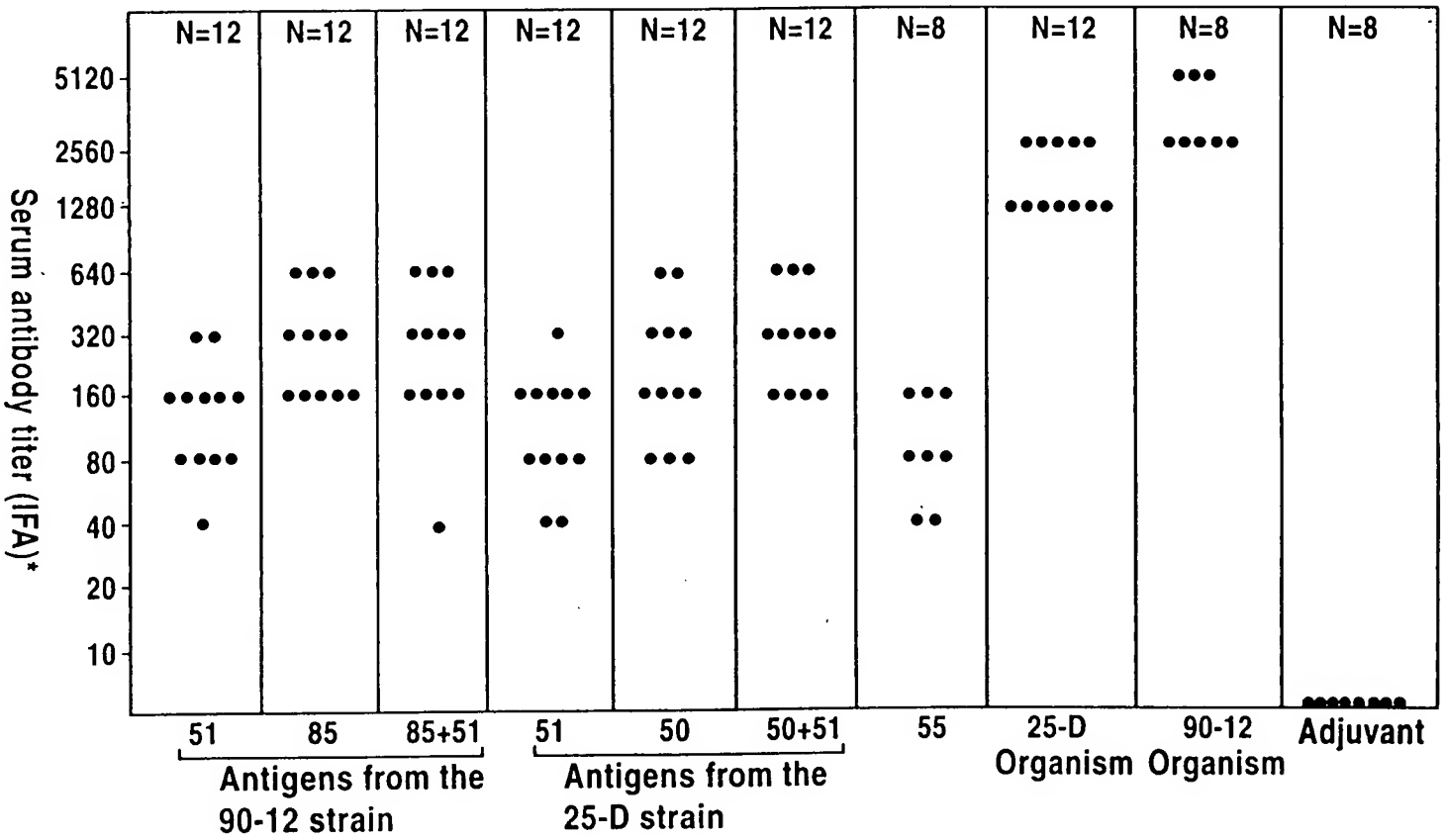
10
Serum antibody titer (IFA)*
51
55
85
85+51
90-12
Adjuvant
Organism

Fig.7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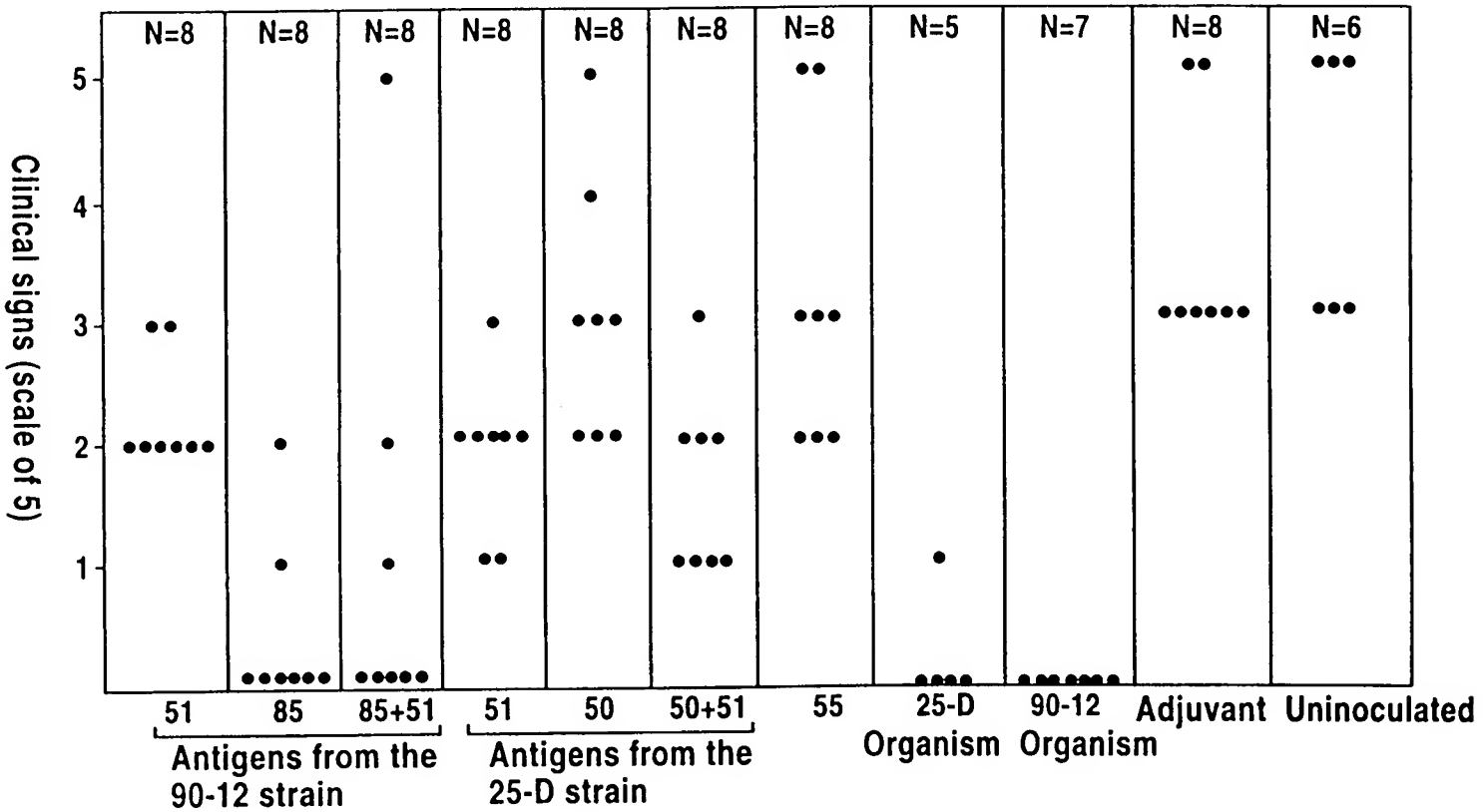
160
80
40
20
10
Serum antibody titer (IFA)*
51
85
85+51
51
50
50+51
55
25-D Organism
90-12 Organism
Adjuvant
Antigens from the 90-12 strain
Antigens from the 25-D strain

Fig.8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3
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N=8
N=6
51
85
85+51
51
50
50+51
55
25-D
90-12
Adjuvant
Uninoculated
Organism
Organism
Antigens from the 90-12 strain
Antigens from the 25-D strain

Fig.9